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Tetracycline-controllable selection of CD4(+) T cells: half-life and survival signals in the absence of major histocompatibility complex class II molecules.

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A system that allows the study, in a gentle fashion, of the role of MHC molecules in naive T cell survival is described. Major histocompatibility complex class II-deficient mice were engineered to express Ealpha chains only in thymic epithelial cells in a tetracycline (tet)-controllable manner. This resulted in tet-responsive display of cell surface E complexes, positive selection of CD4(+)8(-) thymocytes, and generation of a CD4(+) T cell compartment in a class II-barren periphery. Using this system, we have addressed two unresolved issues: the half-life of naive CD4(+) T cells in the absence of class II molecules (3-4 wk) and the early signaling events associated with class II molecule engagement by naive CD4(+) T cells (partial CD3 zeta chain phosphorylation and ZAP-70 association).

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